REMARKS

Applicants have amended Claims 21 and 22 and added new Claims 27 and 28. Support for the amendment can be found generally throughout the text, specifically at page 27, lines 1-13. Applicants submit no new matter has been added by the present amendment.

Specification Objection

The Specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. Applicants traverse this rejection as the claimed subject matter is disclosed at page 26, line 16 through page 27, line 13 . However, Applicants have amended the Specification to include the language of Claims 21-26 and accordingly, request withdrawal of this ground of rejection.

Claim Rejection - 35 U.S.C. § 103(a)

Claims 8, 10-18 and 21-26 again stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ostoja-Starzewski, et al. (U.S. Patent No. 6,353,064). Applicants respectfully traverse this ground of rejection.

Applicants submit that "in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claims limitations. The teachings or suggestions to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure." See MPEP § 2142, citing In re Vaeck, 947 F.2d 488, 20 USPQ 2d. 1438 (Fed. Cir. 1991).

Applicants respectfully submit Ostoja-Starzewski, et al. does not render the present invention obvious. The present invention is directed to a process for the homopolymerization or copolymerization of one or more olefin, cycloolefin, isoolefin, alkynes or diolefin monomers comprising the step of admixing one or more monomer in

the presence of at least one transition metal compound having at least two ligands and at least one donor-acceptor interaction between the ligands, wherein at least one ligand is a fluorenyl ligand and the transition metal compound has at least one alkyl or aryl group on at least one acceptor atom, and optionally one or more co-catalyst, wherein the process is carried out at a temperature from about –60 to about +250° C, wherein the process produces polymers having a mean molar mass M_n greater than 500 kg/mol.

Applicants submit the present unobvious invention provides a very economic process, in part, because the claimed specific selection of donor-acceptor metallocene catalysts are very active, even when only small amounts of co-catalyst are utilized. It is possible according to the present unobvious process and catalyst to prepare high molecular weight and ultra high molecular weight polymers, even at elevated temperatures. As previously noted, it has been very difficult, in the art, for high and/or very high molecular weight EPM or EPDM to be prepared with metallocenes at usual process temperature, e.g., 40-80° C.

The present invention overcomes these historical processing problems and the present invention, therefore, unexpectedly provides easy access to preparing elastomers with bimodal molecular weight distributions (as noted in Figure 1) and the claimed specific catalyst structure unexpectedly leads to long chain branching. This has been achieved unexpectedly by choosing the claimed combination of ligands and of substituents on an acceptor moiety within the wide field of donor-acceptor metallocenes out of thousands of possible derivatives The cited art did not provide any evidence that the claimed invention would result.

The Office Action assumes that the donor-acceptor metallocene polymerization catalysts used in U. S. Patent No. 6,353,064 would likewise generate such high molecular weights. This is not the case because the catalysts of U. S. Patent No. 6,353,064 do not have the specific structure claimed in the present invention, and even if MAO is used under similar experimental conditions as U. S. Patent No. 6,353,064, the molecular weight is even decreased.

The following examples illustrate this fact.

The metallocene in Example 2 of U. S. Patent No. 6,353,064 is a donor-acceptor metallocene but without a fluorenyl ligand and without alkyl or aryl substituents on the acceptor moiety. The elastomeric polypropylene formed has an intrinsic viscosity of only 0.79 dl/g. When instead of TIBA/montmorillonite MAO is used as cocatalyst, the intrinsic viscosity drops to an extremely low value of 0.11 dl/g, which corresponds to a viscosity average molecular weight of only 7 kg/mol.

The metallocene in Example 9 of U. S. Patent No. 6,353,064 is a donor-acceptor metallocene but without a fluorenyl ligand and without alkyl or aryl substituents on the acceptor moiety. The EHM elastomer (ethylene-hexene copolymer) formed has an intrinsic viscosity of 1.22 dl/g. When instead of TIBA/montmorillonite, MAO is used as cocatalyst, the intrinsic viscosity drops to an even lower value of 0.68 dl/g. This should be compared to the present invention and Example 9 of the present invention where, due to the improved metallocene structure the EHM formed, has an intrinsic viscosity of 3.74 dl/g.

The metallocene in Example 3 of U. S. Patent No. 6,353,064 is a donor-acceptor metallocene but without a fluorenyl ligand and without alkyl or aryl substituents on the acceptor moiety. The EPDM elastomer formed has an intrinsic viscosity of 1 dl/g. When instead of TIBA/montmorillonite, MAO is used as cocatalyst, the intrinsic viscosity drops to an even lower value of 0.47 dl/g, which corresponds to a viscosity average molecular weight of only 21 kg/mol. This should be compared to present inventive Example 24 where due to the improved metallocene structure the EPDM formed has an intrinsic viscosity of 7.01 dl/g and a viscosity average molecular weight of 949 kg/mol.

The metallocene in Example 1 of U. S. Patent No. 6,353,064 is a donor-acceptor metallocene but without a fluorenyl ligand and without alkyl or aryl substituents on the acceptor moiety. The High Density Polyethylene (HDPE) formed at 45 – 54 °C has a viscosity average molecular weight of 402 kg/mol. When instead of TIBA/ montmorillonite, MAO is used as cocatalyst at 80 °C, the viscosity average molecular weight of the HDPE formed is only 214 kg/mol. This should be compared to the present inventive Example 8, where due to the improved metallocene structure the UHMw-PE formed at ca. 80°C has a viscosity average molecular weight of 2244 kg/mol.

Accordingly, Applicants submit the presently claimed inventive process produces polymers with molecular weights higher than that disclosed by U. S. Patent No. 6,353,064

Respectfully submitted,

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